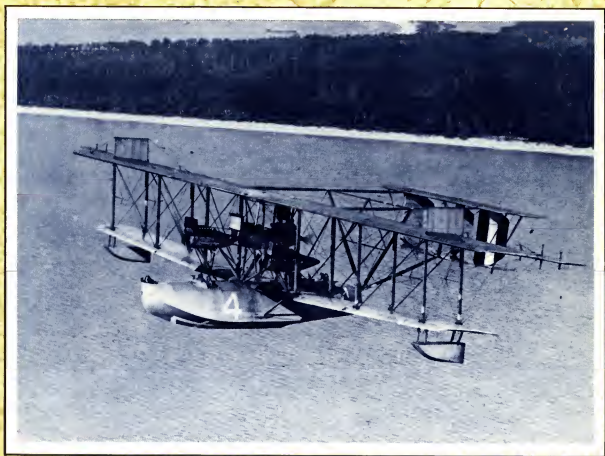


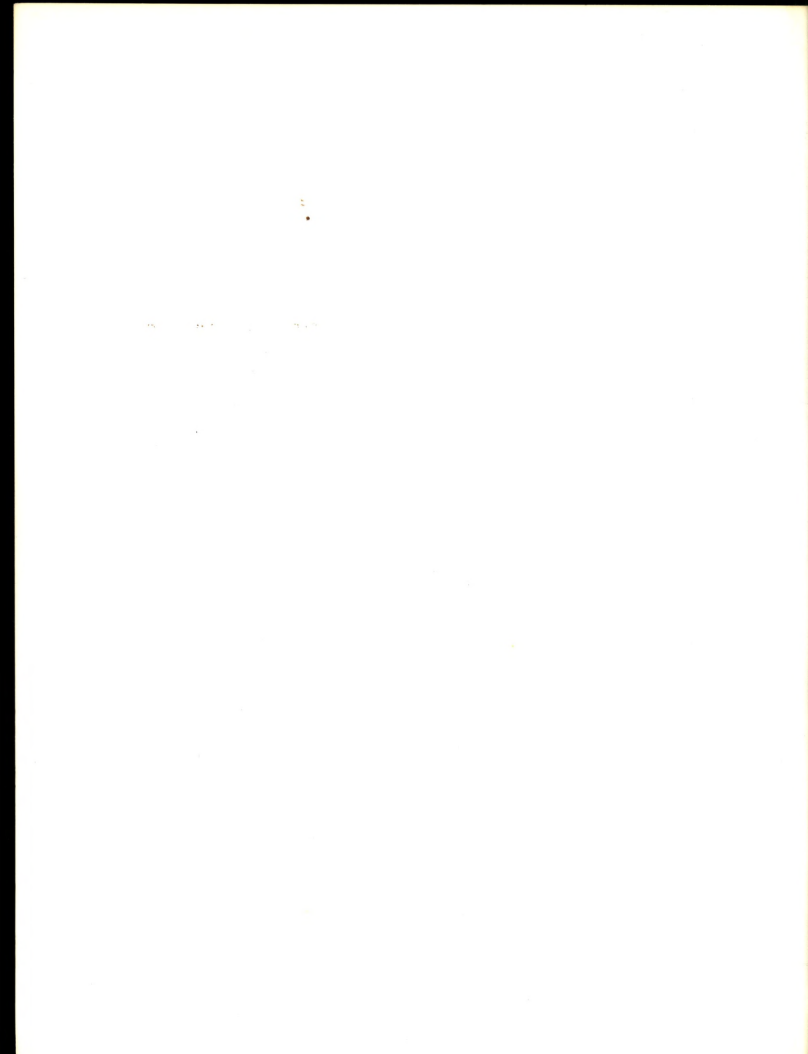
# *Aircraft Photo Album*



**VOL. 1**

**\$3.50**

*Compiled by Peter M. Bowers and Paul R. Matt*



Awm

# *Aircraft*

## PHOTO ALBUM

### *Volume 1*

COMPILED BY

*Peter M. Bowers*

AND

*Paul R. Matt*

*Books of lasting value from:*

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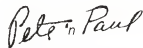
# Introduction

Welcome to the first issue of AIRCRAFT PHOTO ALBUM, the new series of just plain old fashioned airplane picture books. This issue is but the first, for we plan many more in the future. Once a schedule is formulated we hope to bring out two or more issues a year. There is nothing fancy or modernistic on tap, just a lot of aeronautical goodies. While all categories in the field of aviation will be touched upon — lighter-than-air, powerless machines, rotary winged aircraft, powerplants, armament, markings, color schemes, and all the other sundry items that go into aeronautical history, we will however, mostly portray **things with wings**.

This series of picture books came about after many discussions and a mutual realization of just how far aviation has progressed in such a short length of time. We reviewed our own extensive files, talked to others, both private collectors and public resources, and were astounded at the amount of material never before seen. The thought struck us — why should we harbor these many unusual and rare photos — why not share them with others? Hundreds of requests have been received over the years for photos of many of these subjects. To produce original prints and captions for all of these interested viewers would be impossible. The most sensible approach is to put them into print and in book form, thus allowing more enthusiasts than ever to share in these views.

Each issue will contain as many illustrations as practical without resorting to the general practice of jamming in as many postage-stamp size prints as possible. We feel quite strongly that quality must take precedence over quantity. Only the finest reproduction processes on high quality paper will be used. We want to give you as much detail in each illustration as possible. In time we will be adding more pages, more photos, and eventually color.

From box-kite to jumbo-jet, from hot air balloon to supersonic monster, AIRCRAFT PHOTO ALBUM will present the best photo illustrations possible to make them outstanding in context and unique in coverage. We hope you enjoy this first issue and find it both interesting and useful. May you have many hours of happy browsing and exciting research.



Peter M. Bowers  
Paul R. Matt

## COVER PHOTO

*The first airplane to cross the Atlantic ocean — the Navy-Curtiss NC-4. The big flying boat, pride of the post WW I Naval Air Fleet, was photographed on her first leg of the flight — May 8, 1919 on her way to Halifax, Nova Scotia. She was forced down at sea near Chatham, Mass. at 7 AM, May 9 due to engine trouble. With an engine change, she left for the long overwater adventure again at 9:16 AM, May 13, 1919. No further difficulties were encountered and Nancy Boat 4 reached Lisbon, Portugal at 4:01 PM, May 27 averaging 81.3 knots on the last segment of the historic flight.* (U.S. Navy)

Cover design by/PAUL R. MATT  
Graphics by/JAMES DUNAVENT

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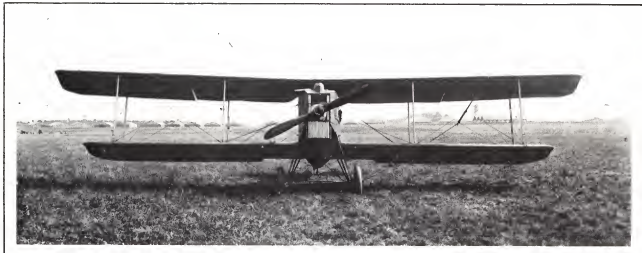
Library of Congress  
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SBN No. 911852-50

# The Breguet 14

The Breguet 14, which was introduced late in 1916 by the Societe Anonyme des Ateliers d'Aviation Louis Breguet of Paris, was typical of the large two-seat observation and light bombing planes that evolved in the middle of World War I. Originally powered with the 300 h.p. Renault engine, the Breguet 14 was delivered in two versions; the observation model 14A-2 and the light bomber 14B-2. In the French designating system,

the A indicated "Corps d'Armee", or observation, B identified bombardment, and the -2 meant two place. The Breguet 14's equipped a large number of French squadrons in WW I and remained in service for several years after. The United States bought 229 14A-2's and 147 B-2's. The 9th and 96th Observation squadrons used them at the front, but most were used for spares and training.



Breguet 14A model distinguished from the 14B by short-span lower wing. This one does not have horn-balanced ailerons.



Breguet 14A-2 with horn-balanced ailerons. Principal Breguet recognition feature was negative-stagger wings. Standard version, with 300 hp Renault engine, had unique "Rhinceros-Horn" exhaust stack.

A few Breguet 14As were tried with the American Liberty engine. A V-12 like the Renault, the Liberty had the exhaust stacks on the outside of the cylinder banks for an easy recognition feature.



An American Expeditionary Force (A.E.F.) Breguet 14A-2, France 1918. The 14s had dihedral in the top wing only.

(USAF Photo)

Experimental modification of a Breguet 14A-2 with rounded lower wing tips and the nose radiator replaced by two French Lamblin radiators under the nose.





Experiments in camouflage were carried out on this Liberty powered Breguet 14A-2 by the U.S. Air Services at McCook Field, Dayton, Ohio after WW I.



Floatplane version of Breguet 14A-2 with unusually wide central float and wing tip floats mounted under the inner bay of struts. Featured four-blade propeller and dip-float at rudder post.

Ambulance version of the 14A was known as the 14S, (for "Sanitaire"). Fuselage modified to carry two stretcher cases in addition to a medical attendant.



Yackey Aircraft Co. of Forest Park, Ill., modified a few Liberty powered Breguet 14As after WW I and marketed them as Yakkey Transports. Note four-place front cockpit and corrugated aluminum covered fuselage.



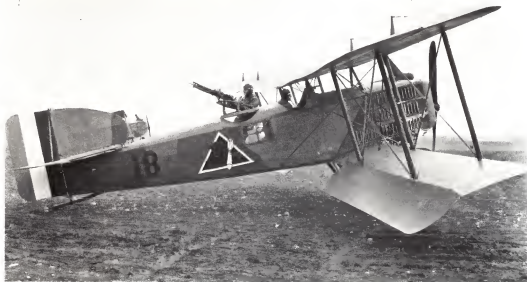
Breguet 14A of 9th Observation Squadron, A.E.F., which crashed behind American lines on Sept. 27, 1918. Good underside details — unique six-strut landing gear, camera port in belly and white center 1918 U.S. wing insignia. (National Archives)



Breguet 14B-2, bomber version — easily distinguished by the longer lower wing. This one, in French markings, was used by the A.E.F. bombing school at Clermont, France, June 1918.



Breguet 14A-2 modified to carry passengers in a forward cabin was known as 14-T (Transport). This postwar French civil version still carries its military rudder stripes.



Breguet 14B-2 of 96th Observation Squadron, A.E.F. Full-span lower wing flap, a feature of the B model, was automatic. Rubber bands on the lower surface pulled it down when airspeed was below 70 mph. (National Archives)

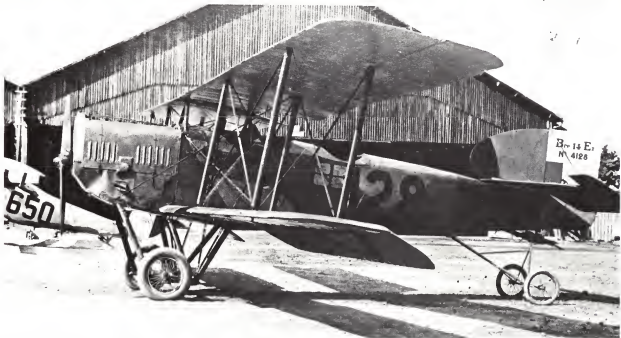


BREGUET 14B-2, 96th Squadron, AEF, 1918



An A.E.F. Breguet 14B captured by the Germans. Note that the rudder stripes, starting at the trailing edge, are red, blue and white — a goof on the part of French manufacturers who thought American tail stripes would be in the same sequence as the wing cocades.

(German Official Photo)



Fiat 285 hp powered Breguet 14-E2 used by A.E.F. in France 1918 as a trainer. Machine gun attached to side of fuselage just under pilot cockpit. "E" in designation stood for "Entrainment".



Post WW I surplus Breguet purchased by a San Diego, Calif. flyer in 1920.

(Ed Morrow)



Breguet 16Bn-2 was a bomber developed from the 14B-2 (Bn = night bomber). Engine was the same 300 hp Renault but wing-span increased to 55'-6" from the 47'-1" of the 14Bs. Ailerons in both wings, three bay interplane struts.



Two seat fighter development of the Breguet 14A-2 was the 17C-7, the "C" a "Chasse", or pursuit plane. Slightly shortened upper wingspan and a 420 hp Renault engine gave it a top speed of 140 mph, compared to 114 for the 14A-2.



# Captive Observation Balloons

Balloons have been put to military use since shortly after the invention of the hot air balloon in 1783 and the subsequent development of the more efficient hydrogen-filled type.

Napoleon used captive balloons to observe enemy troop movements in some of his campaigns. The use of balloons by both sides in the American Civil War is well known. Some of these were captive, anchored to one point on the ground to permit continuous observation of a given area and assure retrieval of the balloon and its observer. Others performed daring scouting flights as free balloons, the observer trusting that he could change altitude and find favorable air currents that would drift him back over friendly territory.

Most military use of observation balloons involved the captive type. Until the end of the 19th Century, these were spherical in shape and had many disadvantages. Their round form made them unstable when any wind was blowing. In addition to bouncing around they would tend to rotate, making them unsuitable platforms for steady observation.

To eliminate these faults, the Germans developed the kite balloon, which was stabilized by the resistance of the anchoring cable to the wind. With what appeared to be a long and narrow small balloon secured to one end to serve as a tail fin, the kite balloon had a definite forward and rear end and always pointed into the wind like a weathervane. Further stability resulted from the fact that this new type of balloon, which was quickly nicknamed "Drachen" (Dragon), flew (if that is the word for balloons) at an appreciable angle of attack relative to the wind instead of level. This position also derived some lift from the reaction to the wind and justified the name kite balloon.

The following photographs show an early spherical captive observation balloon, the "Drachen" that served well into World War I, and the greatly improved French "Caquot" model that replaced it.



A spherical observation balloon used by the Austrians and based on a barge sometime prior to WWI. Similar operations were conducted by the Union Army in the American Civil War.



A German "Drachen" about to ascend on a training flight early in WW I. The balloons were not based in such wide open areas when operating near the front.



Earlier "Drachen", above, used the German flag instead of painted-on Iron Cross insignia for identification. Right — a "Drachen" at working altitude and trailing a "tail" of cloth cups rather like small inverted parachutes that drag like a kite tail and help keep the balloon pointed into the wind. Several handling ropes, used by the ground crew, show clearly. Observers sat in wicker basket below balloon.

(Zensurstelle Luftstreitkräfte)





A French Nieuport 16, with electrically-fired rockets mounted on the outer wing struts, attacks a German "Drachen". Because of greater accuracy, incendiary machine gun ammunition proved to be a more effective anti-balloon weapon.



The greatly improved "Caquot" observation balloon developed by the French had three fins for better stability. Although carrying French insignia, this one was operated by the American Expeditionary Forces. Mallancourt, Meuse, October 1, 1918.



View of an American "Caquot".

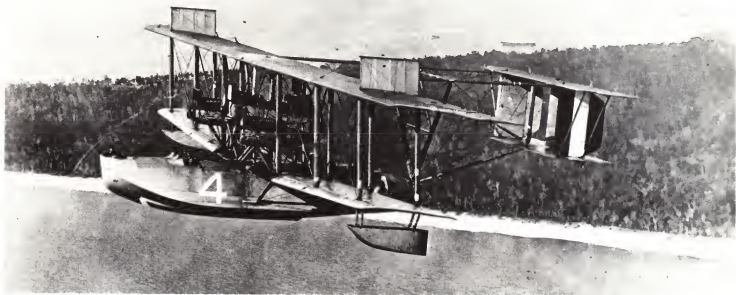


Until well after WW I, observation balloons were filled with highly inflammable hydrogen gas. This one caught fire at a U.S. training base on April 2, 1918. (National Archives)



A helium filled "Caquot" at Lakehurst Naval Air Station in the late 1920s. Although more costly and does not have the lift of hydrogen, helium is non-flammable and therefore more desirable for use in balloons and airships. (U.S. Navy)

# U.S. Navy's Nancy Boats



1969 is the anniversary of the first flight of an airplane across the Atlantic Ocean. A race to accomplish this was under way, sponsored by the British newspaper DAILY MAIL, in early 1919. The U.S., which already had plans of its own for a transatlantic flight, was not a contestant in the race, although the timing gave that impression.

The Navy made its attempt with three four-engine flying boats and took every precaution for the safety of the planes and their crews, setting up a line of 21 destroyers between Trepassey Bay, Newfoundland, the starting point and the Azores Islands, and another 14 between Azores and Portugal. The hops from Rockaway Naval Air Station, L.I. to Halifax, Nova Scotia, and from Nova Scotia to Trepassey Bay were not considered part of the transatlantic flight.

The three planes, NC-1, 3, and 4, left Rockaway on May 8, 1919, with NC-1 and 3 making the 540 nautical miles to Halifax the same day. Both reached Trepassey, 460 nautical miles farther on, on May 10 but NC-4 did not get there until May 15. Takeoff across the Atlantic was on May 16, with the first scheduled stop at the Azores, 1200 nautical miles away. Only NC-4 went the entire distance, reaching Lisbon, Portugal, 950 nautical miles from Horta in the Azores on May

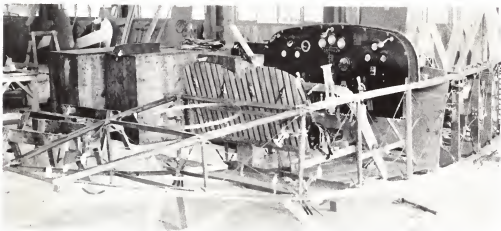
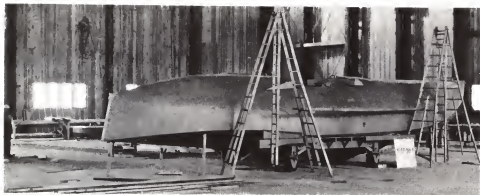
27 and Plymouth, England, on May 31. The 775 nautical miles from Lisbon to Plymouth, with stops at Figuera and Ferrol, Portugal, are not considered part of the "transatlantic" flight, but 10 additional ships were stationed along the route across the Bay of Biscay.

The NC boats were conceived in 1917 as a type of airplane that could be delivered by air to the European war zone and be able to fly in military operations soon after arrival. This concept and the basic design of the new boats was developed by the U.S. Navy but detail design and actual construction were turned over to the Curtiss Aeroplane and Motor Company, which built the four boats on the original order at its experimental plant in Garden City, L.I. These, designated NC for Navy-Curtiss, were numbered consecutively within the class in the manner of naval ships; NC-1 thru NC-4. A second order resulted in six more NC's; NC-5 through NC-10. However, all of these were built in the Naval Aircraft Factory in Philadelphia after World War I.

The following photographs show the evolution of the NC's, nicknamed "Nancy Boats", from the original trimotor configurations to four engines and show off the more noticeable differences between the planes.



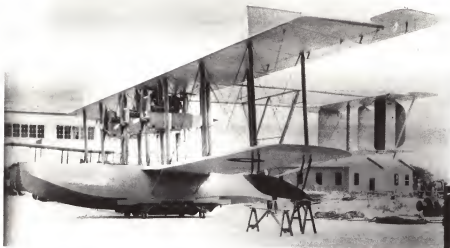
The NC-1 under construction.



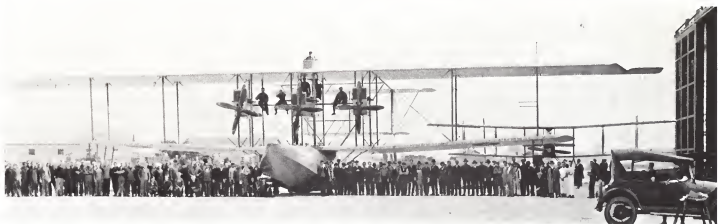
Original pilot's cockpit of the NC-1 was located in the center engine nacelle. Pilot and co-pilot sat side-by-side behind the tractor engine.

NC-1 on October 3, 1918, the day before the first flight. Color is Navy gray hull and metalwork and clear doped fabric wings and tail.

(U.S. Navy)

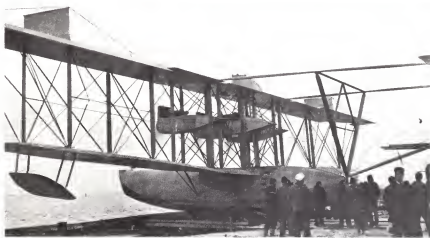


First engine run-up on the NC-1, Oct. 1918. Note that all three tractor Liberty engines are in a straight line and that the out-board nacelles are braced by four vertical struts. (U.S. Navy)



The NC-1 is eased down the slipway on railroad tracks into the water.

(Fred C. Dickey)

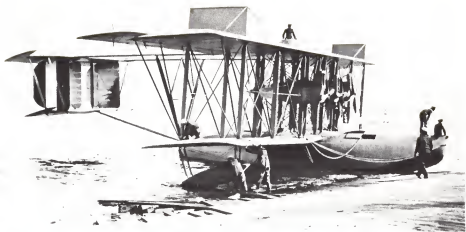


NC-1, all three engines blasting away, is prepared to enter her new environment. Topside gunner's "crows-nest" was novel feature on NC-1.

(Fred C. Dickey)



NC-1 in January 1919, still a trimotor and not yet carrying the number 1. The "Duck Tail" ends of the flat sided engine nacelles are evident.



NC-1 in its patrol bomber configuration.  
(U.S. Navy)



The NC-1 as modified to four-engine  
NC-TA (Transatlantic) configuration.  
The fourth engine has been added  
to the rear of the center nacelle.

The odd-shaped two-blade propellers  
are special design by Naval Aircraft  
Factory Constructor Holden C. Richardson,  
pilot of NC-3 on the Transatlantic flight.  
This propeller design was first tested on  
the Curtiss-Wanamaker "America"  
flying boat in 1914.



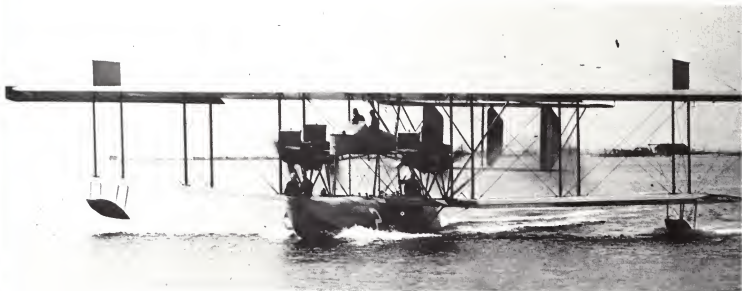


NC-1 preparing to leave Rockaway Naval Air Station, Long Island, for Trepassey Bay, May 8, 1919. Commanding Officer was Lt. Commander P.N.L. Bellinger and the first pilot was Lt. Commander Mark A. Mitscher, who achieved his fame in World War II.

NC-1 was forced down at sea approximately 100 miles east of Flores, in the Azores. After taxiing for five hours, it was taken in tow by a ship but sank after the tow line broke.



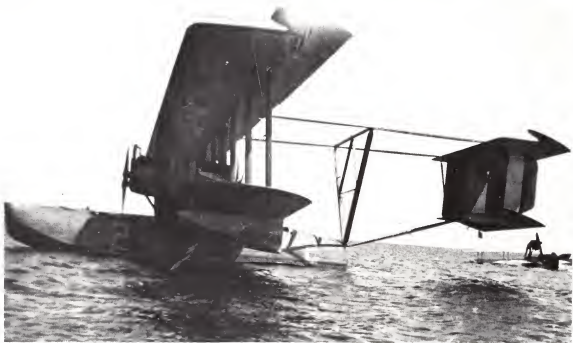
The NC-2, like the NC-1, was also built as a trimotor, but the center engine was installed as a pusher. The pilots were again located in the center nacelle. Note entirely different strut arrangement at the outboard nacelles. Photo, Jan. 1919.



NC-2 was also converted to four engines for the Transatlantic flight, but with an entirely different arrangement than NC-1. Engines were mounted in tandem pairs in two nacelles, which were moved inboard from the original locations. The pilots still rode in a center nacelle. (U.S. Navy)

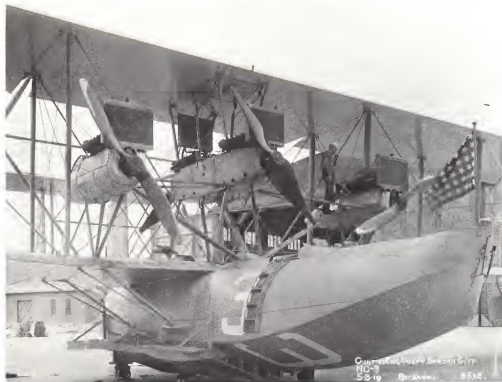
The idea of keeping the pilots of NC-2 in a nacelle did not work out well so they were relocated to a conventional cockpit near the bow of the hull in a manner of the modified NC-1. The tandem engine arrangement was not satisfactory either, and NC-2 was withdrawn from the Transatlantic flight operations.

(Fred C. Dickey)



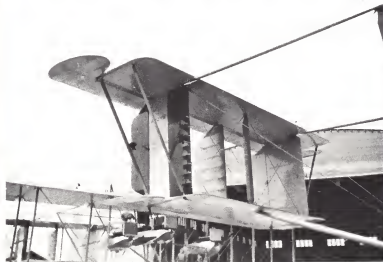
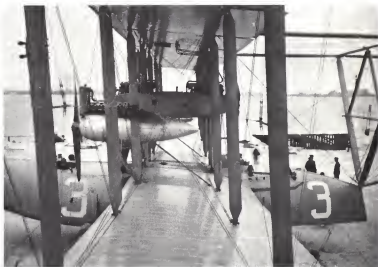
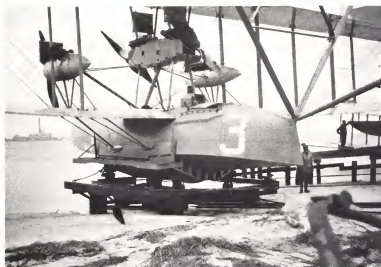
After sustaining the damage shown, the wings from NC-2 were removed and installed on NC-1, whose wings had sustained much greater damage in a storm late in March 1919.

(Gary Farrar)

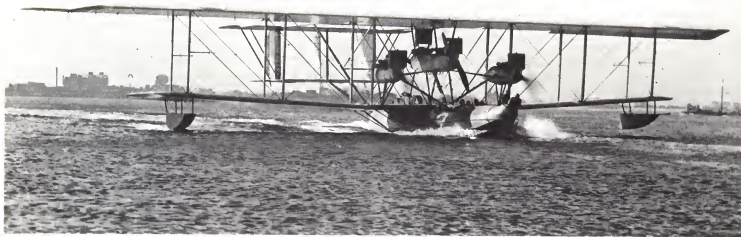


The NC-3, which was completed with four engines after the conversion of NC-1 and -2, was selected as the flagship of the Transatlantic flight. It is shown here on May 3, 1919, following commissioning ceremonies.

(Curtiss Engineering Corp.)

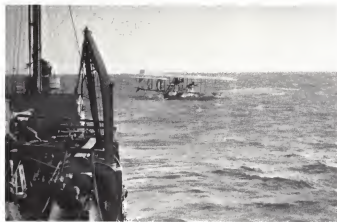
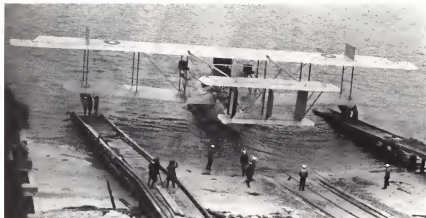


Details of NC-3 show new strutting, rounded cross section of engine nacelles and center engines placed higher than those outboard.



NC-3 during a test flight at Rockaway N A S

NC-3 departing Rockaway for Halifax, May 8, 1919. Commanding Officer, and commander of the expedition, was Commander John H. Towers. First pilot was Commander H. C. Richardson, one of the chief designers of the NC boats.



NC-3 was forced to land at sea approximately 45 miles west-northwest of Horta, Azores, landing point of NC-4. Unable to takeoff again, it taxied for over two days, missing several of the islands in the fog or dark. It was sighted by a ship when only seven miles from Ponta Delgada. Commander Towers refused a tow from the ship and brought NC-3 into harbor under her own power after 205 nautical miles of taxiing.

NC-3 arrives in the harbor at Ponta Delgada, Azores. Not until the crippled boat had made it to the harbor did the crew accept outside help. John Towers was a determined and stubborn officer.





NC-4 was the last of the NC-TA boats built and was not launched until April 30, 1919. It was commissioned with the others on May 3, 1919, and tookoff from Rockaway for Halifax on May 8.

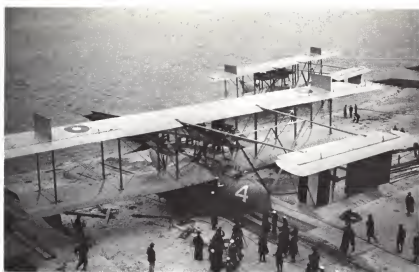


NC-4 was originally tested with Richardson propellers, as seen here. Officers are adjusting brackets for drift indicator. Note original small number 4 on underside of hull. This was painted over and a single large 4 was used further forward in final scheme.

NC-4 was similar to NC-3 in design and construction. Richardson propellers were replaced with these standard versions for the Transatlantic flight.



Out for a taxi run and engine check.



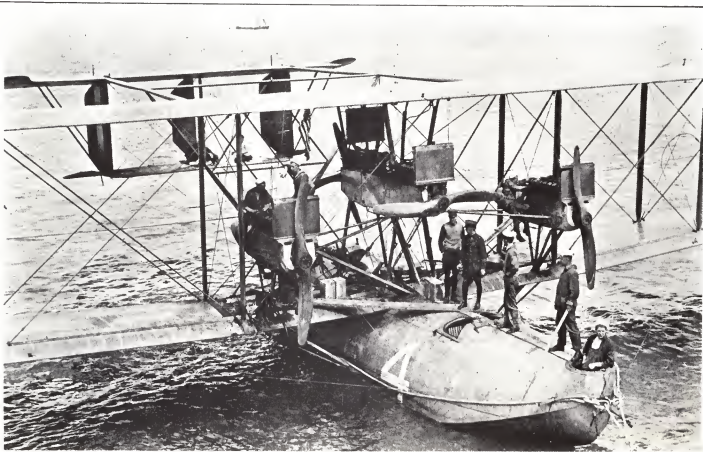
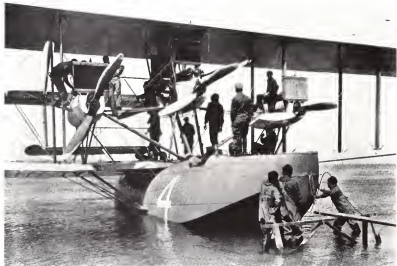
NC-4 and -1 at Rockaway during early trials. Thousands of stills and movies were taken then but most are buried deep in archives at this time.

Commanding Officer of NC-4 was Lt. Commander Albert C. "Putty" Read, first pilot was Lt. E. F. Stone and second pilot was Lt. (j.g.) Walter Hinton.

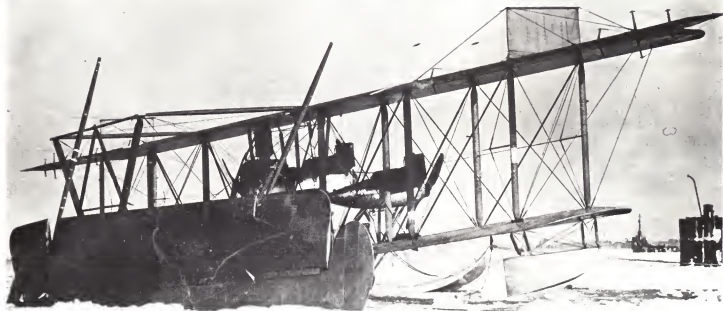
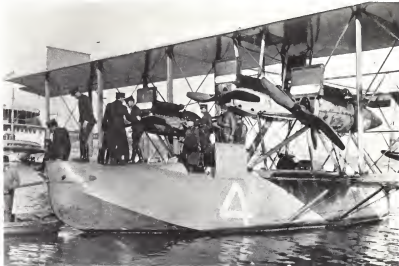
(Smithsonian Institution)

NC-4 afloat in the harbor of Lisbon, Portugal, May 27, 1919. First landing in the Azores was made at Horta on May 17. On May 20, a short hop took her 150 nautical miles farther to the original destination of Ponta Delgada. It took off from Ponta Delgada for Lisbon on May 27.

(Smithsonian Institution)



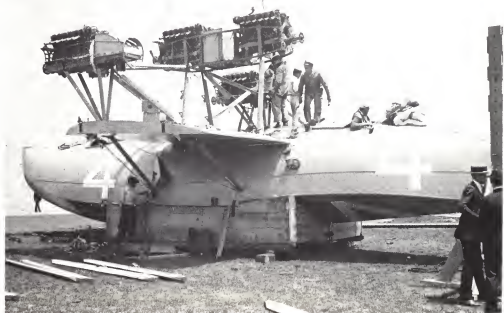
After the NC-4 was returned to the United States, it was set up for display in Central Park, N.Y.C., then reassembled at Rockaway for a tour of eastern states. Here it arrives at St. Louis, Mo., on November 19, 1919.

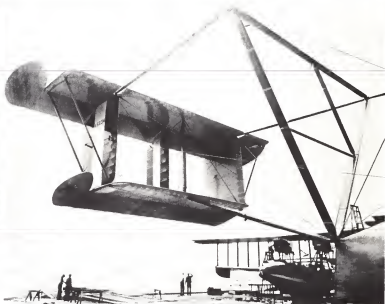
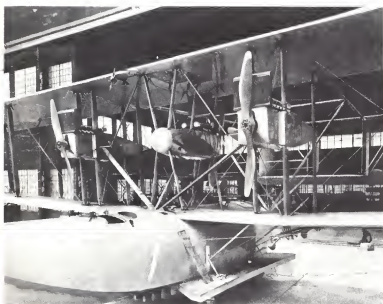
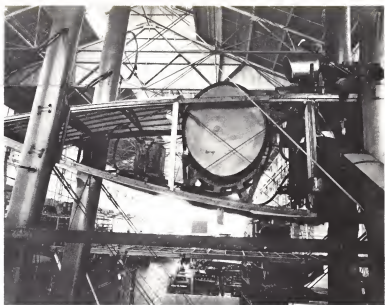
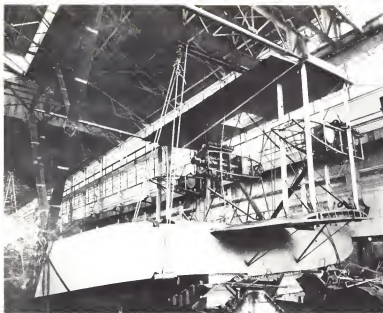


## *NC-4 broken up by the ice*

Following its exhibition tour, the NC-4 suffered extensive damage from ice, (much more than shown here). Rather than repair it for flight or scrap it, it was decided to preserve it for the Smithsonian Institution.

Final outdoor appearance of NC-4 for nearly 50 years took place at the foot of the Washington Monument for the Shrine convention in the 1920s. After this display it was again dismantled and moved into the nearby Smithsonian, where only the hull was put on display.



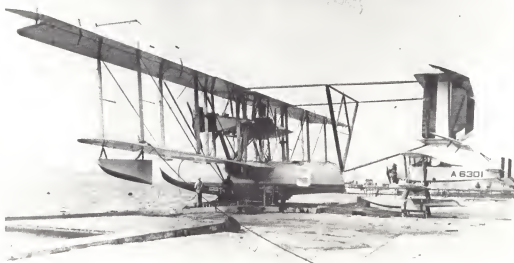


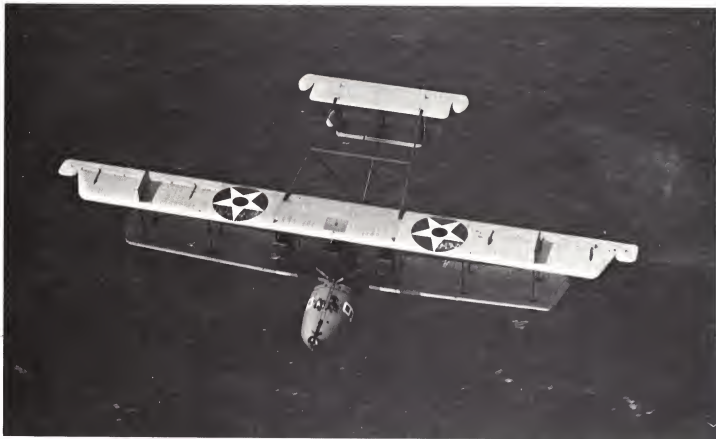
Construction details of NC-7, a regression to the trimotor principle with the center engine used as a pusher. It was later modified to standard four engine configuration.  
(Smithsonian Institution)

NC-9, built at the Naval Aircraft Factory, poses with a Navy-designed TS-1 fighter for a comparison of sizes. NC-5, 8, 9, and 10 were four engine models in the NC-3 and -4 configuration, while NC-6 and -7 were trimotors in the NC-2 configuration.

or losing directional control

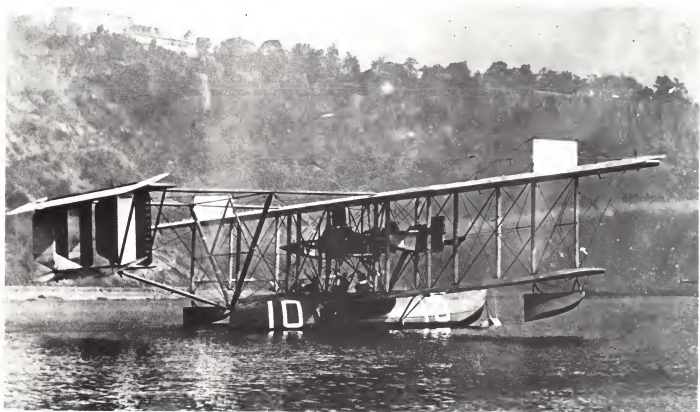
(U.S. Navy)





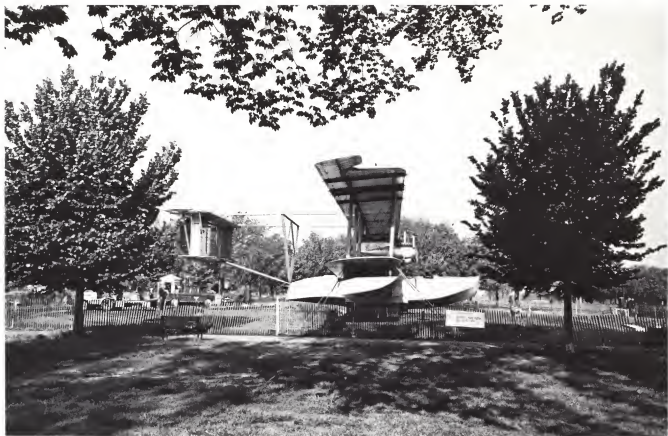
NC-9 in flight, displaying what are undoubtedly the largest star-in-circle markings ever carried by an American military airplane. Wing chord of the NCs was 12 feet. During WW I and

for a few years thereafter, wing insignias were applied to the full wing chord, up to six feet. However, it was ruled in the early 1920s that the maximum diameter would be 5 feet.

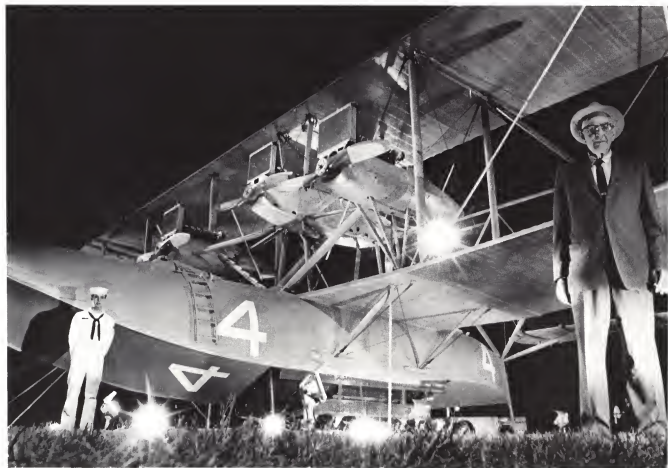


NC-10, the last of the NC boats. These were supposed to have become P2Ns in the new Naval aircraft designating system of 1923, but the original designation was retained.

(U.S. Navy)



Alone and lonely, the NC-4 sits on the Washington, D.C. Mall during the 50th Anniversary celebration and exhibit, May 1969.  
(James A. Johnson JOC, USN)



Eugene S. Rhoads, mechanic on the NC-4 during the 1919 Transatlantic flight, poses with the reconstructed plane on the Washington, D.C. Mall during summer 1969 celebration. Note incorrect small 4 used on underside of hull — an unforgivable goof as the hull originally had the correct large 4 on it.  
(Geoffrey Gilbert, Washington Daily News)



Still in excellent exhibit condition, the NC-4 was quite an engineering feat for 1917 when she was designed. The flight across the Atlantic was an even more spectacular feat in 1919. Now, 50 years later, she can still proudly span her wings of glory for all to see and for a moment cause us to contemplate—how magnificently far trans-atlantic flying has come in those

short 50 years. In spite of her proud heritage, the U.S. Navy was very disappointed over the little and insignificant exposure this bit of history got in the press and with the general public. **AIRCRAFT PHOTO ALBUM** hasn't forgotten her beacon of light in aeronautical advances nor the men of the U.S. Navy who pioneered it all.

(James A. Johnston JOC, NAN Photo)





Transatlantic Navy-Curtiss NC-4 enroute to Halifax, Nova Scotia, May 1919

U.S. Navy

# A Visit to the Airport

These pictures were taken by 14 year old Boardman C. Reed during visits to Vail Field, Los Angeles, then the terminus for Western Air Express, during several weekends in June and July, 1928. Boardman's keen interest in the airport and its activities is reflected by the details he covered and the notations he made on both sides of the prints, which were mostly taken with a size 120 (2" x 3") Brownie box camera.

Boardman is to be commended for such far-sighted documentary photography at such an early age. Most of the other photographers with the intensive hobby of airplane photograph collecting are interested only in the airplanes and work very hard to eliminate all buildings, cars and other airplanes from the backgrounds and yell themselves hoarse trying to get the people out. They want their birds posed entirely "in the clear"; see representative photos throughout this book.

As a result, the details of the old airports, now important to historians, were not recorded. Boardman not only photographed the buildings but he aimed his trusty Brownie at pilots and passengers as well, and even noted the fact that on a particular day the mailplanes were parked facing east while the transports were facing north. It is doubtful that other amateurs could duplicate Boardman's performance today; kids with cameras can no longer wander around air terminal flight lines with such freedom.

Boardman C. Reed learned to fly in 1936, flew with the California National Guard and retired from the United States Air Force as a Lt. Colonel in 1956. He entered the Anglican Ministry where his current clerical duties, in Hanford, Calif., have hardly diminished his aeronautical interests. Father Reed is still as meticulous in recording the details of time and place for the photos he takes today as he was over 40 years ago.

JULY 17, 1928. TUESDAY.



W.A.E. TERMINAL — VAIL FIELD.

VAIL FIELD, LOS ANGELES.



U. S. MAIL PLANE HANGER.

Views of Western Air Express and U.S. Mail hangars, sheds and gas shack, at Vail Field, July 17, 1928.

WAE Douglas M-2 mailplane (Boardman labelled it M-1) — undergoing maintenance in hangar doorway. Note the tail skid dolly at lower right; a piece of ground equipment long gone from the airports. July 17, 1928.

W.A.E. CONTRACT ROUTE No. 4.



DOUGLAS MAIL PLANE.



One of Western's more modern equipment—a Fokker F-10 July 28, 1929 (WAEs third out of an eventual total of 25 F-10s and F-10As).



Although not the best in camera technique, this shot of a Douglas M-2 is invaluable to historians today. June 9, 1928.



A rare bird — WAEs single Dutch built Fokker F-7A trimotor (one of only two on U.S. trunk airlines). This was sold by WAE and operated by another airline, a fact Boardman promptly recorded at another airport. June 9, 1928, Sat. A.M., W.A.E. #100.



The Boeing 95 mailplane (W.A.E. #52) flown by Jimmy James. June 2, 1929.

WESTERN AIR EXPRESS



FOKKER TRI-MOTOR F-10.

Didn't quite get it all in but the ancient Fokker F-10 was photographically recorded just the same. Results of a true historian.

MAIL PLANES FACING EAST.



PASSENGER IN MAIL PLANES

ALL MAIL PLANES FACING EAST.



PASSENGER. - MAIL FRONT.



Improper film winding resulted in partial double exposure of three W.A.E. Douglas M-2s and a rare Monarch biplane, Sunday, June 2, 1929.



Bart Cox, Chief pilot,  
and  
Eugene Drury, 2<sup>nd</sup> pilot  
July 28, 1929,  
Sunday



Fokker F-10.  
(The one I flew in)  
Western Air Express, L.A.  
August 1, 1929  
Thursday



me, beside tail of  
Fokker F-10.  
July 28, 1929 - Sunday

Boardman took a sightseeing flight over Los Angeles in a W.A.E. Fokker F-10 on July 28, 1929, which he recorded right down to the pictures of the crew and a confirming "I was there" snapshot of himself by the rudder with the registration number well displayed.

# They were supposed to fly

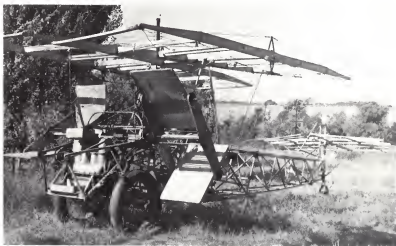
*For as long as man has tried to fly, and ever since he succeeded, inventors have been trying out highly unconventional forms of flying machines. Some proved reasonably successful but could not break into the established market, some just barely flew, but most had no chance at all. An interesting selection is presented here.*



This French d'Ecquevilly multiplane dates from approximately 1908. Aside from the odd arrangement of flat lifting surfaces and absence of a tail, a unique feature is the propeller, looking like a pair of rowboat oars, belt driven by a 22 hp Anzani "fan" three cylinder aircooled engine.

This is a "Flying Machine" built by C. E. Brooks between 1910 and 1940 at Pattonville, Mo. Some relatively late structural concepts are used in the steel tube fuselage but the engine resembles a Model A or B Ford.

(Truman C. Weaver)



All that is known of this 1909 biplane is that the builder was of Portuguese descent, that it was 6½ meters long, had 25 square meters wing area and weighed 250 kilograms (550 lbs.) Power was a 60 hp French Anzani.



This California product was built later than 1912 as established by the 48-star American flag. The California flag would indicate that state and the general area gives a feeling of San Diego

beach front. The early Roberts engine, is definitely pre-World War I stock.

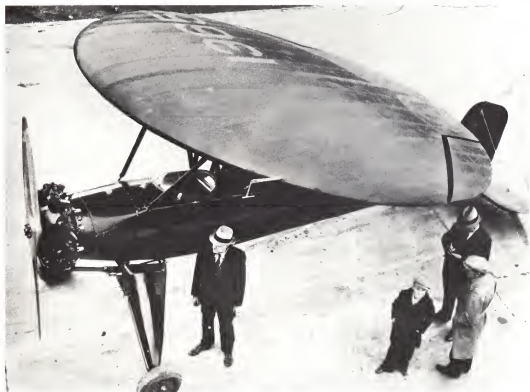


One of the farther-out aeronautical ideas of the famous William B. Stout, whose fame is linked with the design and construction of the predecessor of the Ford trimotors. This canard design

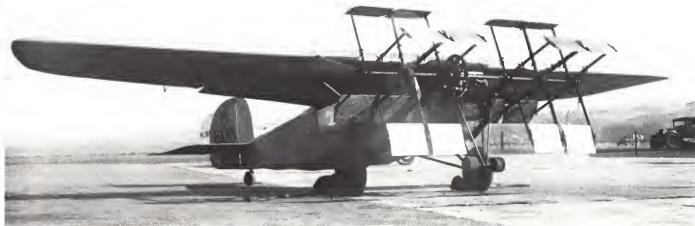
was photographed in May, 1927. Engines are two 32 hp Bristol "Cherubs". That's Stout sitting on the right wingtip.

(Stephen J. Hudek — Ford Motor Co.)

The original "Flying Saucer". This Arup Flying Wing, nicknamed the "Flying Pancake" among other things, flew quite successfully in the early 1930s. This concept was revived again during WW II by Vought, which built the V-173 as a low speed flying mockup for the radical XF5U-1 fighter.



The Lanier Paraplane of the early 1930s featured a completely circular wing on an otherwise conventional airplane. The long landing gear was necessary to establish a high angle of attack for the wing when the plane was taking off or landing.



There is an established type name for a relatively conventional airplane like this fitted with such a propeller—it's called a

"Cyclogyro". This one was at Mills Field, San Francisco, around 1930.

# Versatile Things Those Flying Machines

The following photos show some aircraft activities that are not found in the normal daily routine around the airport. While some, like flying under bridges, were fairly common in the free and easy period between

the end of WW I and the adoption of licensing and regulation in 1927, they are illegal today. Some just passed from the scene as times change, while others were outright stunts.



How to have fun on skis — just have the pilot of a plane, like this 1921 Sperry Messenger on skis, tow you the length of a snow covered airfield at 60 mph!

Earl S. Daugherty of Long Beach, Calif. just loved to fly under things. He takes his Polsen special single seater, built in 1915, under a bridge.



The famous German WW I ace and post-war stunt pilot, Ernst Udet, picks up a handkerchief with a hook on the wingtip of his Udet U.12 at the 1933 U.S. National Air Races. While the FAA permits some pretty low flying under air show waivers, it doesn't like pilots **quite** this low these days.



Rumanian areobatic pilot Alex Papana also had the wingtip pickup in his bag of tricks. Using his trusty Bucker Jungmeister he snags the American flag at the 1936 Los Angeles, National Air Races.



Stunt pilot Frank Clark, in rightside Travel Air, and Paul Mantz, in upside down Boeing 100, perform amazing wheels-to-wheels fly-by at Oakland, Calif. Air Show in 1936.



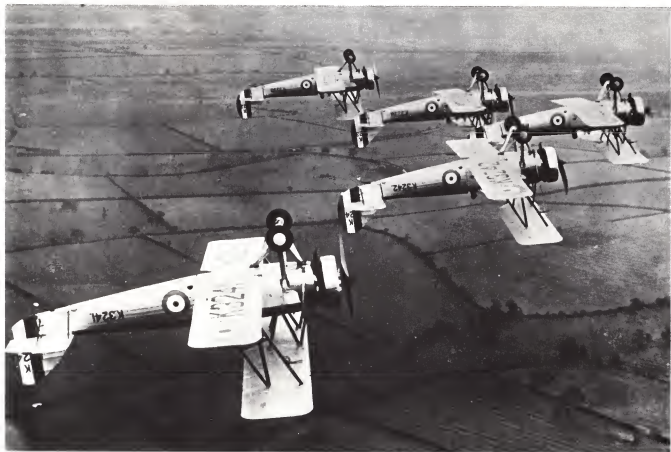
This is a 1930 Waco primary glider fitted with pontoons and towed behind a motorboat. We wonder if the trapeze artist climbed up onto the floats or dropped into the water before the glider landed.





Flying under bridges is legal at times, at least in the case of seaplanes that either can't come in over the bridge to their landing area or climb over it after takeoff. This is a British

Supermarine "Southampton" flying under the Firth of Forth bridge in Scotland. Below — Avro "Tutors" on a routine inverted formation training exercise in the early 1930s.



## Wildcat Overboard

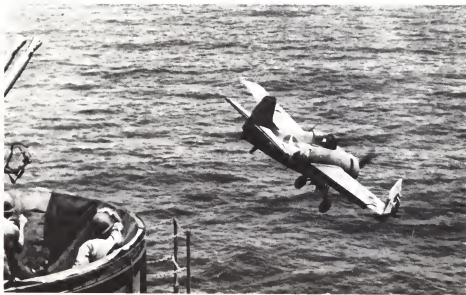
An unusual photo-sequence showing a Grumman F4F-4 "Wildcat" fighter diving overboard from a U.S. Navy aircraft carrier during World War II. These photos were released quite a while after the event but still under wartime censorship, so details as to the carrier and the date were not given.



The "Wildcat" heads overboard! Since the plane is ahead of the carrier's "Island", it is hard to determine whether the incident is the result of a poor landing or losing directional control on takeoff.



Appearing to be in level flight, the plane is past the guns and now has a broken wingtip.



With no flying speed, the plane can only head one way . . . DOWN.

SPLASH!



The Wildcat bobs to the surface and the pilot climbs out of the cockpit.



As his plane starts to sink by the nose, the pilot breaks out the life raft, just visible at the right side of the fuselage.



U.S. Navy photos

# Surrender Markings

During the negotiations preceding the formal surrender of Japan in August 1945, it was necessary that certain Japanese military aircraft be allowed to fly. To assure the legitimacy of these missions, the Allies decreed that entirely different markings, and in some cases color schemes, be used on the planes. These have

since been referred to as "Surrender Markings". Some representative examples are shown in the following photos, all taken by Peter M. Bowers on Lunghwa and Kiangwan Airdromes, Shanghai, China, shortly after V-J Day.



Nakajima "Kate" torpedo bomber painted all white with narrow dark green crosses. The "Betty" bombers, used to carry the initial Japanese envoys, were also all white.



Watanabe K11-W-1 on Kiangwan Airdrome in all white surrender markings. This little known recon. plane bears a strong resemblance to the pre-war North American O-47.





Mitsubishi "Zeke 52" fighter in standard coloring — dark green top and sides, silver painted undersides. Surrender markings are green crosses on white squares. Souvenir hunters have cut the symbol from the fabric covered rudder.



Another "Zeke 52" in standard camouflage. It was permanently grounded before wing crosses could be applied.



A Mitsubishi SJ "Pine" utility plane displaying two form of the surrender markings on standard camouflage — white square on the fuselage and a circle on the wings. These planes were originally painted overall yellow-orange, but those sent to the war zones were overpainted with dark green tops and sides and a light greenish-blue on undersurfaces.

## Marking goofs...

After V-E Day, many German war planes were taken to England and the United States for test and evaluation. In most cases, these had their original Luftwaffe markings removed and replaced with British or American markings. Later, when it became desirable to put some of these on public display, attempts were made to restore the original markings since German planes would be expected to appear in their combat dress. However, many of the restorations were made without any attempt at accuracy. A black cross with a white border, regardless of the size or proportion, should be good enough for the purpose as far as officialdom

was concerned. Some of the replacement markings were pretty far out, as these photos show, and all so needlessly. In some cases, the original markings were still discernable under the later coats of Allied paint and could easily be traced. In other cases, there were plenty of accurate reference photos in technical manuals, aircraft recognition manuals, etc.

Several examples of these goofed-up markings, with photos of some original applications to establish the correct proportions, are presented here with comment.

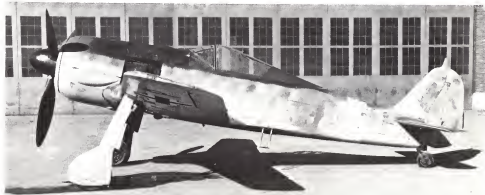
## "Liberated" German WWII Aircraft



An original German Focke-Wulf FW-190A-5 with proper national and operational unit markings. The upper wing crosses are in the same proportion as the black fuselage cross but with a narrower white border. Underside crosses have same border width as fuselage cross.

FW-190A-5 captured before the end of the war and sent to the United States for evaluation. A start was made at removing the original markings at Wright Field but the job was not completed and the original crosses remained under the wings. In this case the fuselage and fin markings were not painted over — they were sanded off.

(USAF Photo)



The same FW-190A after the decision was made to fly it in spite of the war still being "on". Note that the new fuselage cross is considerably narrower than the original and is chopped off at the bottom. The Swastika on the vertical fin is considerably larger than the original.

(USAF Photo)



A Messerschmitt Me-109G in standard national and operational markings.



An Me-109F, captured and sent to the United States for test. This one has been stripped of most of its paint but some of the operational markings on the fuselage are still visible. However, the U.S. star insignia has been improperly applied. (If the painter can't even get his own insignia correct, how can they be expected to do an accurate job on enemy markings?)



This Me-109G, displayed in a public park after the war, is all goofed up. The fuselage cross is not only the wrong size, it isn't even symmetrical: the vertical bar is wider than the horizontal. The Swastika on the fin is reversed; regardless of which side of the plane it's on, the top arm of the "Hakenkreuz" always points to the right.

(Ed. Delgen)



One of the Me-109Gs tested after the war at Freeman Field, Seymour, Indiana. This one was stripped of all paint and given horribly inaccurate markings. The fuselage cross is out of proportion; the colors are reversed! Wing crosses are in the

mid-1918 style and the fin Swastika has the black arms too narrow and the white border much too narrow. Like the U.S. and British, German markings were applied according to precise specifications.

(USAF Photos)

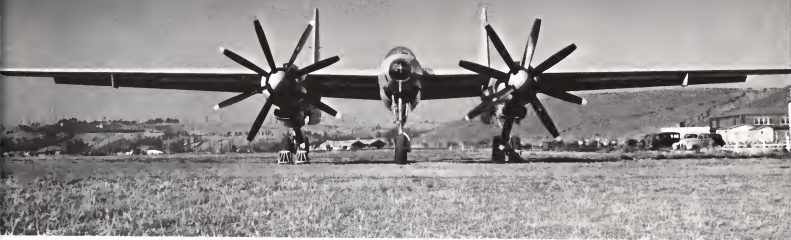


An Me-109K-6 photographed at Patterson Field, Ohio after it had been parked in a display area open to the public in 1946. Fuselage cross wrong proportion and size. Apparently the whole

color scheme was an American repaint job, as the only original marking that could be found on the plane was the fuel grade marked in the triangle just above the figure 7 on the fuselage.

(Peter M. Bowers)

# Hughes XF-11



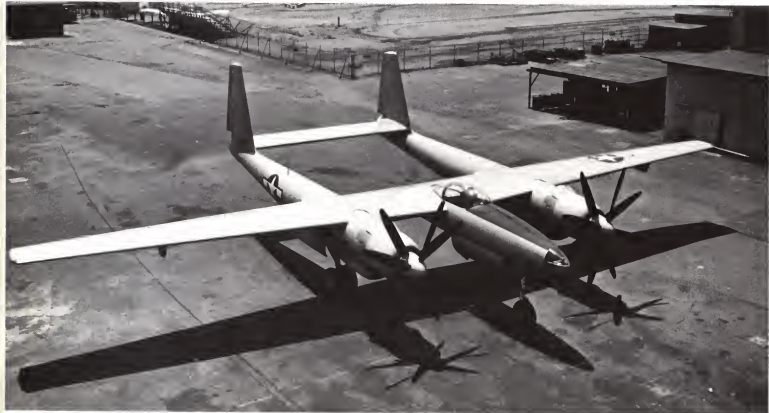
*In 1944, the U.S. Army awarded the Hughes Aircraft Company a contract for two experimental XF-11 photo-reconnaissance planes, a small service test order, and an order for 98 production F-11s. All of these, except for the two prototypes and one static test article, were cancelled following V-J Day.*

*The second XF-11 was completed with single-rotation propellers. This was delivered to Wright Field for tests and proved to be a surprisingly good airplane, right at the time that the Hughes war contracts were under investigation by Congress.*

Hughes Aircraft photos

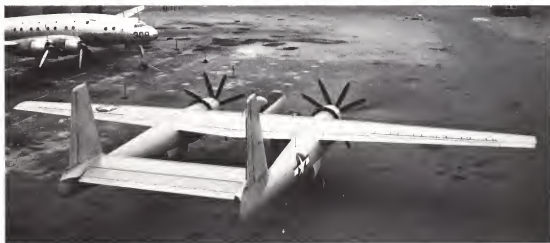
*The first XF-11, powered with 3000 h.p. Pratt & Whitney R-4360-31 engines driving eight-bladed Hamilton-Standard contra-rotating propellers, made its first flight on July 7, 1946, with Howard Hughes piloting. Trouble with one of the propellers caused the plane to crash, seriously injuring Hughes.*

*Other than being the world's largest and heaviest two-seater at the time, (span 101'-4", length 65'-5", weight 58,315 lbs.) the unusual feature of the XF-11 was the pod-and-twin-booms layout, making it look somewhat like an overgrown P-38. Instead of using the standard metal finish of the time, the XF-11 used a gray filler coating that was highly polished. This was similar to that used on the Army's new jet fighters, the Lockheed P-80 (see page 48) and the Republic XP-84.*





Hughes XF-11 No. 1





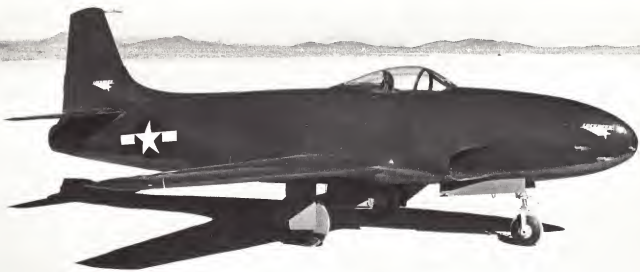
Hughes XF-11 No. 2



A.U. Schmidt



Warren Bodie



The original Lockheed XP-80 in standard Army olive drab and gray finish, Muroc Dry Lake, January 1944.

## LOCKHEED P-80 Shooting Star

The first American jet fighter to achieve significant production was the Lockheed P-80. Design work was started in June 1943, to use the British De Havilland H-1 turbojet engine. In only 139 days, the XP-80 prototype was completed and trucked from the factory in Burbank, California, to the secret Army Air Force test center on Muroc Dry Lake, 150 miles to the north. The first flight was four days later, on January 8, 1944. The second and third prototypes were finished as XP-80A, and a service test order for 13 carried the designation of YP-80A. Lockheed, following its established policy of naming its aircraft after celestial bodies, promptly christened the new model "Shooting Star".

The official designation of P-80 (P-for-Pursuit) was changed to F-80 (F-for-Fighter) in the widespread Air Force redesignations of June 1948. While two of the YP-80A's got to Europe just before V-E Day, the Shooting Star did not see action until the Korean War of 1950-1953. All of the 1501 P F-80's built have been retired now, but two-seat trainer variants known as T-33A in the Air Force and TO-2, TV-2, and finally T-33B in the Navy, are still in service. These two-seaters far outnumbered the original single-seaters, 5691 having been built between 1948 and 1959.



Modified form of the XP-80, with 3000 lbs. thrust DeHavilland H-1 engine.

(Lockheed Photo)

The second prototype: first of two XP-80As. These had 22½ inches more wingspan than the XP-80 and were 20 inches longer. Power was early General Electric I-40 with 3000 lbs. thrust (designated later J-33).

(Lockheed Photo)





The 12th YP-80A. Because of high fuel consumption of jet engines, it was necessary to develop auxiliary fuel tanks to give the P-80 a practical range. Those shown are the original 165 gal. versions.  
(U.S. Air Force)



A production P-80A, emphasizing the long nose characteristic of the jet fighter with their engines mounted amidship.



One of three P-80As bought and flown by U.S. Navy under Army designations. Navy serial number on vertical tail in Army style. One was fitted with an arrestor hook and tested on an aircraft carrier.

(U.S. Navy)



F-80B, photographed after the Army Air Force became the U.S. Air Force in September 1947 and after the FN "Buzz" letters for F-80 had been changed to FT.

(E.M. Sommerich)

F-80A-10-LO with Group Leader markings and flags indicating extensive travel in Europe. 100 lbs. practice bombs on wingtips were used in live bombing demonstration at 1948 National Air Races, Cleveland.

(Peter M. Bowers)



Unconventional orange and white color scheme on an obsolescent Iowa Air National Guard F-80A-1. The "O" in front of serial number on the tail stands for "Obsolete" and is applied to ten year old aircraft to prevent duplication of serial number by another USAF plane built 10 years later.

(Peter M. Bowers)

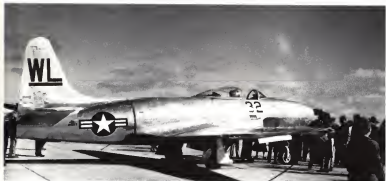




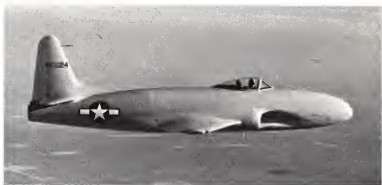
One of 798 P/F-80Cs built in 1948/49 with 5400 lbs. thrust J33-A-35 engines. Military flights from Japan to Korea resulted in development of 260 gal. tip tanks shown. (Chalmers Johnson)



The P/F-80B was an improved version, with thinner wings and the 5200 lbs. thrust Allison J-33A-21 engine with water injection. 240 P-80Bs were built. (E. M. Sommerich)



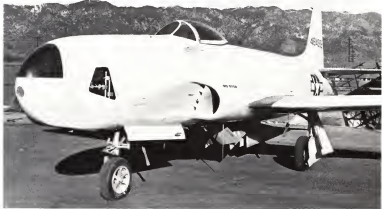
Navy ordered 50 F-80Cs under designation TO-1 (T for Trainer, O for Lockheed). In spite of trainer status, Marine VFM-311 squadron was equipped with TO-1s as land based fighters in 1948. TOs became TVs when Navy changed Lockheed symbol to V in 1950. (Chalmers Johnson)



The last YP-80A was converted to an unarmed photo plane under the designation of YF-14 (F for Foto). Cameras were carried in the nose. (USAF Photo)



FP-80A-5-LO, winner of jet division, 1946 Bendix Race, Los Angeles to Cleveland, at 494.8 mph, used regular P-80 Buzz numbers. (Peter M. Bowers)



Production versions of the YF-14 were designated F-14A until change to FP-80A in late 1945. Nose is larger compared to YF-14. (Lockheed Photo)



In 1948, the FP-80s were redesignated RF-80s (R for Reconnaissance). This is RF-80A-25-LO of Alabama Air National Guard with 260 gal. centerline wing tanks. (Peter M. Bowers)



F-80C with early Fletcher type wingtip fuel tanks.



Red and white P-80A-1-LO at 1946 National Air Races, Cleveland.



Because of the slow acceleration of jet engines, P-80s were tested with solid-propellant JATO (jet assisted take off) bottles to try and improve the takeoff characteristics.

(Lockheed Photo)



This P-80A was tested at Wright Field in June 1947 with a single rocket gun in the nose.

(Peter M. Bowers)



Because of the short range of early jet fighters, serious consideration was given to towing them into combat with other aircraft. This one was tested at Wright Field with a quick release tow attachment on the nose.



An experimental F-80A with ramjet engines mounted on the wingtips.



Wingtip location of the ramjets necessitated special auxiliary fuel tanks to be mounted inboard under the wing.



On June 19, 1947, Colonel Albert Boyd flew this special 'clipped' wing P-80A conversion, designated XP-80R, to a new official World's speed record of 623.8 mph.

(Lockheed Photo)

An all red obsolete P-80A converted to a radio control target drone. Original designation was QF-80A. The extent of modifications on all such planes justified a redesignation — QF-80F.

(Peter M. Bowers)





Two seat trainer version of P-80L, introduced in 1948, was designated TF-80C with 38 inch longer fuselage and an elongated hinged canopy. The improved streamlining made the trainer faster than the fighter.

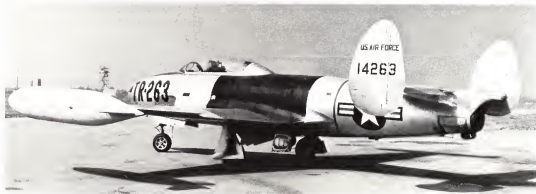
(Peter M. Bowers)

After 128 TF-80Cs were built, the Air Force changed the designation to T-33A, T-33 "Buzz" letters were TR. Altogether, 5691 of the two seaters were built.

(Peter M. Bowers)



Navy version of the T-33A was originally called TO-2; then TV-2. In the changeover from naval designations to Air Force type in 1962, the TV-2s became T-33Bs. This special blue model belonged to the Blue Angels exhibition team in 1956.



During factory tests intended to improve the T-33A for the Navy, a double rudder arrangement was tried. Adaptation didn't meet Navy requirements, so a new model, the T2V-1, was developed.

(Lockheed Photo)



Lockheed T-33As



Lockheed T-33A

(Lockheed Photo)

## INDEX

This is not presented as a detailed index of Volume one. Rather, it is intended to be the start of a cumulative index for all volumes. Subjects will be referred to by issue and page, as 1-3 for the Breguet 14 material on page 3 of Volume 1. Because of the great number of single aircraft photos to be used, it will be impossible to list every one by make and model. Only those that are featured in the form of studies, or a full page of pictures covering one model, will be indexed.

Individual airplanes (or gliders, helicopters, etc.) will be grouped under the several major headings that will be continuing features of the Album such as Jets, Oddities, and the recognized historical periods of World War I, World War II, etc.

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